

AMENDMENTS TO THE CLAIMS

1 – 31. (canceled)

32. (new) A device for dispensing shaped objects singly, which objects to be dispensed singly are packaged in bulk, the device comprising a female part and a male part which mate coaxially with each other, wherein the female part is fixed and the male part is rotatable, wherein

a) the fixed female part (1) constitutes an upstream part for the bulk objects to enter into the device, and comprises:

a1) an external main cylindrical casing (5) which is open at its upstream end (6) and downstream end (7),

a2) an internal casing (8), which is coaxial with the external casing (5), closed at its upstream part (9) and open at its downstream part (10), of which the distance from the external casing (5) is at least equal to the smallest dimension of the object to be dispensed to create a free space (11) for the orientation and organized movement of said objects from upstream to downstream,

a3) a first plane (12), which is close to the upstream end (6), connects the coaxial external casing (5) and internal casing (8) perpendicularly to said axis, is shaped as a circular sector of angle α , is provided with an opening shaped as an arc of a circle (13), and leaves the free space (11) for orientation and organized movement clear,

a4) a second plane (14), which is placed between the first plane (12) and the downstream end (7), connects the coaxial external casing (5) and internal casing (8) perpendicularly to the axis, is shaped as a circular sector of angle β , is provided with at least one opening (15) or (16) dimensioned for the passage downstream singly of the objects present in the free space (11) for orientation and organized movement,

a5) between the second plane (14) and the downstream end (7) of the female part, at least one chute mounted on the at least one opening (15) or (16) of the second plane (14), to allow storage in a queue of stacked objects to be dispensed which originate from the free space (11) for orientation and organised movement, this at least one chute being delimited by the coaxial external casing (5) and internal casing (8) and by two planar lateral walls (19, 21) or (20, 22) by a chute connecting said casings and extending to the downstream end of said female part, the at least one chute being provided at its downstream end with an opening dimensioned for the passage of a single object to be dispensed,

and wherein

b) the rotatable male part (2) constitutes the downstream part for discharge of the dispensed objects from the device, and comprises:

b1) a base platform (23) shaped as a circular disk which forms a stop for the external cylindrical casing (5) of the female part, this platform being provided with an opening (25) dimensioned for the passage of an object delivered by the at least one chute,

b2) a casing (26) coaxial with the base platform (23) to which it is connected, having substantially the shape of the internal casing (8) of the female part (1) of the device, in which it inserts itself to allow the rotation of the male part relative to the female part of the device,

b3) a means (29) for guidance in rotation connected to and perpendicular to the base platform (23), the free end (30) of which is designed to insert itself into the opening shaped as an arc of a circle (13) of the first plane (12) of the female part,

b4) a crown segment (31), mounted on the means for guidance in rotation (29), which moves freely, when the male part (2) of the device rotates, between the two planes (12) and (14) of the female part of the device and which blocks the inlet opening (17) or (18) of the at least one chute, at least partially and at the end of its travel, in at least one direction of rotation of the male part, and

b5) a guide means (33) for the object to be dispensed placed in the axis of the dimensioned opening (25) of the base platform (23) on the external wall of the casing (26) coaxial with the platform (23) of the male part.

33. (new) The device according to claim 32, wherein the external cylindrical casing (5) is equipped on its external surface with a ring (34) which is connected to said casing and acts as a stop.

34. (new) The device according to claim 32, wherein the internal casing (8), coaxial with the first casing (5), has a geometry generated by revolution of a cylindrical, cylindrical/truncated cone shaped, cylindrical/conical, truncated cone shaped, conical or parabolic type.

35. (new) The device according to claim 34 wherein the upstream part (9) of the internal casing (8) is of a truncated cone shaped, conical, hemispherical or parabolic type.

36. (new) The device according to claim 32, wherein the free space (11) created between the external casing (5) and the internal casing (8) reaches a minimum thickness in the most downstream part that is slightly greater than the smallest dimension of the object to be dispensed.

37. (new) The device according to claim 32, wherein the angle α , in degrees, at the top of the circular sector of the first plane (12), is a resultant of the diameters of the shaped objects to be dispensed and the female part.

38. (new) The device according to claim 32, wherein the angle β , in degrees, at the top of the circular sector of the second plane (14), is a resultant of the diameters of the shaped objects to be dispensed and the female part.

39. (new) The device according to claim 32, wherein the second circular sector of angle β of the second plane (14) occupies a position opposite the first circular sector of angle α of the first plane (12).

40. (new) The device according to claim 32, wherein the sum of angles α and β of the two circular sectors is at most 360 degrees.
41. (new) The device according to claim 32, wherein the at least one opening (15) or (16) has a section that is greater than the smallest section of the shaped objects to be dispensed but such that two shaped objects to be dispensed cannot pass through it.
42. (new) The device according to claim 32, wherein at least one opening (15) or (16) has a section that is slightly greater than the smallest section of said objects.
43. (new) The device according to Claim 32, wherein the planar lateral walls (19, 21) or (20, 22) of the at least one chute (17 or 18) are parallel to each other.
44. (new) The device according to Claim 32, wherein the planar lateral walls (19, 21) or (20, 22) of the at least one chute (17 or 18) are concurrent with each other from upstream to downstream of the at least one chute.
45. (new) The device according to claim 32, wherein the device comprises two chutes (17) and (18).
46. (new) The device according to claim 1, wherein the second plane (14), placed between the first plane (12) and the downstream end (7), connecting the coaxial external casing (5) and internal casing (8) perpendicularly to said axis, in the shape of a circular sector of angle β , is provided with two openings (15) and (16) dimensioned for the passage downstream singly of objects present in the free space (11) for orientation and organized movement, these two openings being mutually spaced by an angle γ .
47. (new) The device according to claim 46, wherein the two openings (15) and (16) in the second plane (14) are mutually spaced by the angle γ , delimited by the two sides of said angle passing through the center of symmetry of each of these two openings (15) and (16), this angle γ

being chosen from the range of angular values of approximately 0° when the two openings are juxtaposed up to 180° when the openings are diametrically opposed, regardless of the direction of rotation of the male part (2).

48. (new) The device according to claim 32, wherein the rotatable male part comprises a crown segment (31) mounted on the guide means (29) which, during the rotation of the male part (2), moves freely between the two planes (12) and (14) of the female part and blocks the upstream opening of the chutes (17) and (18), at least partially and alternately at the end of its travel.

49. (new) The device according to claim 32, wherein the casing (20), coaxial with the base platform (23), has a geometry generated by revolution that is cylindrical, cylindrical/truncated cone shaped, cylindrical/conical, truncated cone shaped, conical or parabolic.

50. (new) The device according to claim 32, wherein the free end (30) of the means for guidance in rotation (29), which moves in the opening shaped as an arc of a circle (13) of the first plane (12) of the female part, restricts the rotational angle in either direction by a stop at each end of said opening shaped as an arc of a circle (13) for making the opening (25) of the platform congruent with the downstream end of the at least one chute.

51. (new) The device according to claim 50, wherein the rotational angle of the male part, from one end stop to the other end stop, has an angular value γ , delimited by two sides of an angle passing through the center of symmetry of each of two openings (15) and (16).

52. (new) The device according to claim 59, wherein the free end (30) of the means for guidance in rotation (29) that emerges from the opening shaped as an arc of a circle (13) acts as an agitator for the shaped objects, packaged in bulk in the packaging region.

53. (new) The device according to claim 32, wherein the ends of the crown segment (31) mounted on the means for guidance in rotation (29) are beveled.

54. (new) The device according to claim 32, wherein the guide means (33) mounted on the external wall of the casing (26) coaxial with the platform (23) has a semi-polygonal, semi-circular or semi-elliptical plane.

55. (new) A closed unit for packaging and dispensing shaped objects singly comprising the device according to claim 32, which device is connected and mounted by one of its ends on an open end of a bulk packaging container for the shaped objects to be dispensed, wherein the bulk packaging container is formed by a casing and a cap, and wherein the device is connected by the other of its ends to the cap, which cap is capable of rotating the moving male part of said device in either direction.

56. (new) The closed unit according to claim 54, further comprising a means for containing one or more agents for treating or removing ambient gaseous pollutant.

57. (new) The closed unit according to claim 56, wherein the gaseous pollutant is water vapor.

58. (new) The closed unit according to claim 57, wherein the means for removing water vapor is in the form of an internal covering in the container and/or cap, of an insert placed inside the container and the cap, of the male part of the device, wherein the means is produced from a thermoplastic polymer composition containing a treatment agent.

59. (new) The closed unit according to claim 58, wherein the treatment agent is selected from the group consisting of silica gels, molecular sieves and clays.

60. (new) The closed unit according to claim 56, wherein the one or more agents are used in a powdery or compacted form, and placed in a specific recess situated at the bottom of the container or the bottom of the cap.

61. (new) The closed unit according to claim 56, wherein a gaseous pollutant in addition to water vapor is to be treated or removed, and at least a suitable treatment agent appropriate for treating the additional pollutant is included.

62. (new) The closed unit according to claim 61, wherein the unit comprises one or more open compartments created in appropriate recess inside the unit, which recess is divided into sectors enabling a plurality of mutually compatible treatment agents or mixtures of treatment agents to be received separately.

63. (new) The closed unit according to claim 55, which is produced from a thermoplastic polymeric and/or copolymeric material selected from the group consisting of polyethylenes (PE), polypropylenes (PP), ethylene/propylene copolymers and mixtures thereof, polyamides (PA), polystyrenes (PS), acrylonitrile-butadiene-styrene copolymers (ABS), styrene acrylonitrile copolymers (SAN), polyvinylchlorides (PVC), polycarbonates (PC), polymethyl methacrylate (PMMA), polyethyleneterephthalates (PET), used individually or mixed depending on their compatibility.

64. (new) The closed unit according to claim 63, wherein added to the thermoplastic polymeric and/or copolymeric materials is at least one natural or synthetic thermoplastic elastomer, the thermoplastic elastomer(s) being elastomers of the natural rubber type or synthetic rubber type, or rubbers based on condensation products.

65. (new) The closed unit according to claim 64, wherein the thermoplastic elastomer is selected from the group consisting of olefin-based rubbers, isobutylene/isoprene polymers, ethylene-vinyl acetate (EVA), ethylene-propylene (EPR), ethylene-propylene-diene (EPDM), ethylene-acrylic esters (EMA-EEA), fluoropolymers, diene rubbers, polybutadienes, butadiene-styrene copolymers (SBR), thermoplastic polyester, polyurethane rubbers, silicones, styrene rubbers, styrene-butadiene-styrene (SBS) and styrene-isoprene-styrene (SIS).